NASA SBIR/STTR Technologies
Proposal No. 10-2 X14.02-9524
Non-Thermal Sanitation by Atmospheric Pressure Plasma

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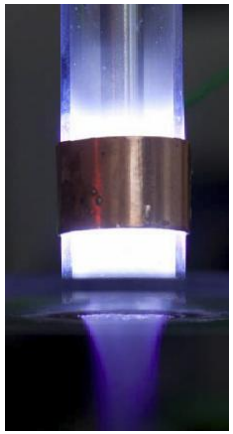
Identification and Significance of Innovation

Non-thermal Sanitation by Atmospheric Pressure Plasma (NTSAPP) uses nonthermal, atmospheric pressure plasma to produce reactive oxidizing species to sanitize fresh fruits and vegetables.
NTSAPP sanitizes fresh fruits and vegetables without the use of consumable chemicals or heat; so food taste and quality are not affected. The technology can function in reduced gravity and pressure environments and is efficient in terms of mass, volume, waste, and resource use. NTSAPP technology can also be used to sanitize working surfaces and instruments.

Expected TRL Range at the end of Contract (1-9): 6



Technical Objectives and Work Plan

Objective

Design, build, and test a prototype system to sanitize food with non-thermal atmospheric pressure plasma.

Work Plan

- Design, build, and test a benchtop prototype plasma reactor and power supply.
- Design, build, and optimize plasma performance of integrated plasma sanitizing system prototype.
- Evaluate antimicrobial efficacy of the integrated plasma sanitizing system prototype with different process gases, food types, and microbe inoculates.
- Evaluate the effect on non-thermal plasma sanitization on food quality.
- Develop a Hazard Analysis Critical Control Point (HACCP) for incorporating NTSAPP into spaceflight food preparation procedures.

NASA and Non-NASA Applications

NTSAPP technology can be used to sanitize fresh foods grown in the space habitat and to sanitize raw ingredients either produced on orbit or sent up as bulk raw ingredients. Non-thermal plasma can replace chemical disinfectants in most spaceflight food applications.
NTSAPP technology can be used for sanitizing food at the point of use, such as a restaurant, or at a food processing facility. This technology can be used in place of chlorinated water, which can leave a residue and is not entirely effective, and irradiation, which generally has a poor public perception

Firm Contacts

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